Section: Anatomy

Original Research Article

EVALUATING THE IMPACT OF EARLY CLINICAL EXPOSURE ON FIRST-YEAR MBBS STUDENTS: A COMPARATIVE CROSS-SECTIONAL STUDY IN A MEDICAL COLLEGE IN TAMIL NADU

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ABSTRACT

Background: Traditional medical curricula often separate basic sciences from clinical practice in the initial years, leading to reduced motivation and limited contextual understanding. The objective is to evaluate the impact of early clinical exposure on academic performance, skill development, and professional orientation of first-year MBBS students. **Materials and Methods:** This cross-sectional observational study was conducted at Swamy Vivekananda Medical College Hospital and Research Institute, Namakkal, Tamil Nadu, from Sept 2024 to Dec 2025. A total of 150 first-year MBBS students participated. Structured ECE sessions were conducted in hospital wards and outpatient clinics, integrating basic sciences with clinical applications. Data were collected using a validated questionnaire, academic performance records, and focus group discussions. **Result:** Out of the 150 participants, 132 (88%) reported that ECE helped them link basic sciences with clinical practice, and 125 (83.3%) stated it improved their motivation for studying. Confidence in patient interaction increased in 118 (78.7%) students, while 110 (73.3%) noted improvement in communication skills. Mean internal assessment scores significantly improved from 58.6 ± 6.4 to 66.8 ± 7.2 after ECE ($p < 0.001$). Overall, 90% of students expressed satisfaction with ECE, with suggestions for more frequent sessions, smaller groups, and greater faculty involvement. **Conclusion:** Early clinical exposure positively influenced first-year MBBS students by improving academic performance, communication, motivation, and professional development.

INTRODUCTION

Medical education has traditionally followed a compartmentalized structure in which the first two years are devoted largely to basic sciences, with clinical exposure delayed until the third or fourth year of training. This separation between theory and practice has been criticized for producing students who may have strong theoretical knowledge but cannot connect it with clinical realities.[1] Increasingly, medical educators across the globe are advocating for reforms that promote integration of preclinical and clinical learning from the earliest phases of medical training. Early Clinical Exposure (ECE) is one of these innovations that has received a lot of attention for its transformative role in shaping the academic, clinical, and professional development of medical students.[2] ECE can be broadly defined as the structured introduction of medical students to real or simulated clinical environments within the initial years of their curriculum.[3] This early engagement is not limited to hospital wards but may also include outpatient clinics, community health centers, or standardized patient interactions. The underlying philosophy is to contextualize theoretical concepts within patient care scenarios, thereby reinforcing learning and motivating students to adopt a more holistic approach to medicine.[4] Importantly, students are also able to develop empathy, communication skills, and a comprehension of patient-centered care competencies, all of which are frequently overlooked in purely didactic instruction. Early clinical exposure (ECE) is a teaching method in a new curriculum, competency-based medical education (CBME), introduced by the National Medical Commission in 2019. In ECE, students get exposed to the clinical environment and the patient as early as in the first year of MBBS. ECE has been

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adopted by many medical colleges all over the world.[5] It helps in bridging the gap between the early preclinical subjects and the clinical side. Entrance exam for medical education is entirely based on the student's academic performance, and that is also theoretical. In the traditional curriculum, long study hours in the classroom, voluminous syllabus, new vocabulary, and mainly theoretical facts without any exposure to the clinical setup are some of the challenges faced by the students in their very first year.[6] Teacher-centered classes with a vast syllabus covered in a short period in the first year, without any clinical correlation, make the subject dry and uninteresting. Students could not recollect the relevant knowledge of basic science during their clinical postings, and could not correlate.[7]

The first year of medical school is a critical transition period. Students often experience an abrupt shift from high school learning styles to the demanding workload and complex expectations of medical education.[8] This period is also associated with a loss of motivation, stress, and uncertainty about future professional roles. Introducing clinical exposure at this stage can act as a motivating factor, helping students appreciate the relevance of anatomy, physiology, and biochemistry in diagnosing and managing patients. For example, seeing the application of cardiovascular physiology in understanding hypertension or the importance of biochemical pathways in explaining diabetes not only deepens conceptual clarity but also fosters curiosity and long-term retention. Research in medical education has shown that early exposure enhances both cognitive and affective learning domains.[9] Cognitively, students achieve better integration of knowledge and develop critical thinking by applying theoretical principles in real-world contexts. Affectively, they gain confidence, reduce fear of patient interaction, and begin to form their professional identity as future doctors. ECE also helps in nurturing soft skills such as communication, teamwork, and ethical sensitivity attributes that are increasingly recognized as central to medical competence.[10]

Moreover, in countries where medical curricula are often rigid and heavily content-driven, incorporating ECE represents a shift towards competency-based education. The World Federation for Medical Education (WFME) and the Medical Council of India (MCI), along with other international bodies, have emphasized the need for early patient contact to produce competent physicians capable of handling complex healthcare demands.[11] ECE aligns with these global trends and supports the training of doctors who are not only technically skilled but also empathetic and socially responsive. Evaluating the impact of ECE on first-year MBBS students is particularly important because this is the stage where foundational attitudes, motivations, and approaches to learning are developed.[12] If implemented effectively, ECE can influence career-long practices, improve retention of knowledge, and strengthen clinical reasoning skills. On the other hand, poor implementation without clear objectives or faculty training may lead to superficial experiences without meaningful learning outcomes. Therefore, systematic evaluation of ECE's impact on first-year medical students is essential for identifying its benefits, challenges, and areas for improvement.[13]

Objective: To evaluate the impact of early clinical exposure on academic performance, skill development, and professional orientation of first-year MBBS students.

MATERIALS AND METHODS

This was a cross-sectional observational study conducted at Swamy Vivekananda Medical College Hospital and Research Institute, Namakkal, Tamil Nadu from Sept 2024 to Dec 2025. A total of 150 first-year MBBS students were enrolled in the study. All students meeting the inclusion criteria were recruited using a non-probability consecutive sampling method.

Inclusion Criteria:

- First-year MBBS students enrolled at Swamy Vivekananda Medical College during the study period.
- Students willing to participate and provide informed consent.

Exclusion Criteria:

- Students who were absent during the clinical exposure sessions.
- Students unwilling to participate in the study.

Data collection: Data was collected using a validated, pre-tested questionnaire designed to evaluate students' perceptions, attitudes, and learning outcomes related to early clinical exposure. Feedback sessions and focus group discussions were also conducted to gather qualitative insights regarding the effectiveness of the program. Academic performance records and participation logs were reviewed to supplement the data. Participants were introduced to structured early clinical exposure sessions throughout their first academic year. The sessions included hospital ward visits, outpatient clinic observation, case-based discussions, and supervised patient interactions. Each session was designed to integrate basic science knowledge with clinical applications, with emphasis on communication, professionalism, and patient-centered care.

Data Analysis: Data were analyzed using SPSS v 21. Quantitative data were analyzed using descriptive statistics (mean, standard deviation, frequency, percentage) and inferential statistics (chi-square test, t-test) to compare academic performance and perceptions before and after exposure. Qualitative responses were thematically analyzed to identify recurring patterns and student perspectives.

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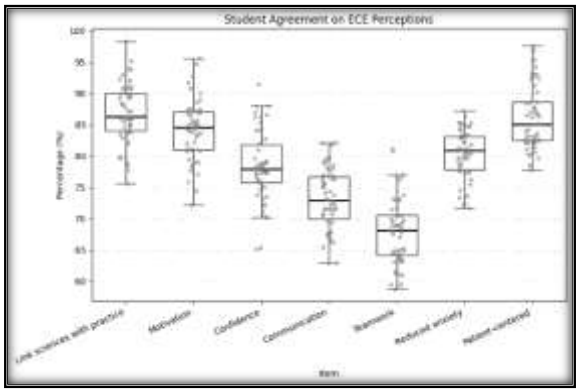
RESULTS

A total of 150 first-year MBBS students participated in the study. The mean age of the participants was 18.9 ± 0.8 years. Among them, 65 (43.3%) were male and 85 (56.7%) were female, indicating a slight female predominance. A large majority, 132 (88%), agreed that ECE helped them link basic sciences with clinical practice, while 125 (83.3%) reported that it improved their motivation for studying. Increased confidence in patient interaction was noted by 118 (78.7%) students, and 110 (73.3%) felt that it enhanced their communication skills. Improvement in teamwork and collaboration was acknowledged by 102 (68%) participants, while 120 (80%) reported that early exposure reduced anxiety about future clinical postings. Additionally, 128 (85.3%) students believed that ECE encouraged a more patient-centered approach to learning [Table 1].

Table 1: Student Perceptions of Early Clinical Exposure (N = 150)

Perception Item	n (%) Agree	n (%) Neutral	n (%) Disagree
Helped link basic sciences with clinical practice	132 (88.0)	12 (8.0)	6 (4.0)
Improved motivation for studying	125 (83.3)	15 (10.0)	10 (6.7)
Increased confidence in patient interaction	118 (78.7)	20 (13.3)	12 (8.0)
Enhanced communication skills	110 (73.3)	25 (16.7)	15 (10.0)
Improved teamwork and collaboration	102 (68.0)	30 (20.0)	18 (12.0)
Reduced anxiety about clinical postings	120 (80.0)	18 (12.0)	12 (8.0)
Encouraged patient-centered approach	128 (85.3)	14 (9.3)	8 (5.4)



Academic performance showed significant improvement following ECE. The mean pre-exposure internal assessment score was 58.6 ± 6.4, which increased to 66.8 ± 7.2 after clinical exposure. This difference was statistically significant ($t = 11.42$, $p < 0.001$), indicating that ECE had a positive impact on student learning outcomes [Table 2].

In terms of overall satisfaction, 72 (48%) of students reported being very satisfied and 63 (42%) reported being satisfied with ECE. Only 10 (6.7%) remained neutral, and a small minority of 5 (3.3%) expressed dissatisfaction. The most common recommendation was to increase the number of sessions, reported by 54 (36%) students. Smaller group interactions were suggested by 40 (26.7%), while 28 (18.7%) emphasized the need for more structured orientation. Enhanced faculty involvement was suggested by 20 (13.3%), and a minority of 8 (5.3%) recommended incorporating simulation-based learning to complement real patient exposure [Table 3].

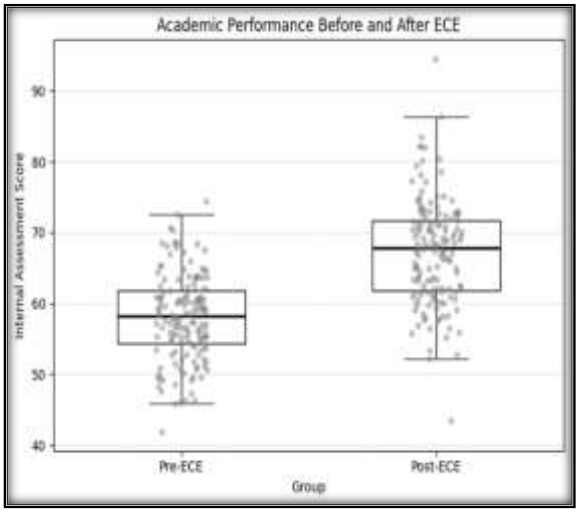


Table 2: Comparison of Academic Performance Before and After ECE (N = 150)

Variable	Mean ± SD	t-value	p-value
Pre-exposure score	58.6 ± 6.4	11.42	<0.001*
Post-exposure score	66.8 ± 7.2		

*Paired t-test applied, statistically significant at $p < 0.05$.

Table 3: Overall Student Satisfaction with Early Clinical Exposure (N = 150)

Satisfaction Level	n (%)
Very satisfied	72 (48.0)
Satisfied	63 (42.0)
Neutral	10 (6.7)
Dissatisfied	5 (3.3)
Very dissatisfied	0 (0.0)
Suggested Area for Improvement	
Increase number of sessions	54 (36.0)
Smaller student groups for interaction	40 (26.7)
More structured orientation	28 (18.7)

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Enhanced faculty involvement	20 (13.3)
Inclusion of simulation-based learning	8 (5.3)

DISCUSSION

This study evaluated the impact of early clinical exposure on first-year MBBS students at Swamy Vivekananda Medical College, Namakkal, Tamil Nadu. The findings demonstrate that structured clinical exposure during the first year of medical education had a positive effect on students' academic performance, motivation, communication skills, and professional orientation. The results strongly support the growing global consensus that introducing patient-centered experiences at an early stage bridges the gap between preclinical sciences and clinical practice. In this study, the majority of students (88%) reported that ECE sessions helped them link basic sciences with clinical contexts, a finding consistent with the pedagogical rationale of integrated curricula.[14] When learners are exposed to the clinical relevance of anatomy, physiology, and biochemistry, they are more likely to retain knowledge and apply it meaningfully. This is in line with prior educational research, which emphasizes that contextual learning improves long-term retention and enhances problem-solving abilities.[15]

The improvement in academic performance, with mean internal assessment scores rising significantly after clinical exposure, highlights the role of ECE in promoting active learning. Similar outcomes have been reported in studies from other institutions where early patient contact was associated with better cognitive outcomes and deeper learning approaches.[16] The increase in motivation and confidence seen among the majority of participants in this study also supports the view that experiential learning promotes self-directed learning, an essential competency for lifelong professional development. Soft skill development was another notable outcome.[17] Over 70% of students agreed that their communication and teamwork skills improved through ECE sessions. This reflects the importance of structured patient interactions in fostering empathy, interpersonal skills, and professional identity formation. These competencies, although not always measurable by traditional assessments, are critical in shaping future doctors who can provide holistic and compassionate care. Furthermore, more than 80% of students reported that early exposure reduced anxiety about upcoming clinical postings, suggesting that ECE serves as a smooth transition between preclinical and clinical training.[18]

The high levels of overall satisfaction (90% satisfied or very satisfied) highlight the acceptability of ECE among students. However, suggestions such as increasing the number of sessions, forming smaller groups for patient interactions, and strengthening faculty involvement indicate areas for curricular refinement. These concerns are in line with challenges reported elsewhere, where inadequate supervision and overcrowded sessions limited the effectiveness of early exposure.[19] Addressing these aspects is crucial for maximizing the benefits of ECE. The qualitative feedback in this study further emphasized that students appreciated seeing the real-world application of theoretical knowledge, which reinforced their motivation and sense of belonging to the medical profession. Professional identity formation at such an early stage can have lasting effects on career orientation, ethical conduct, and commitment to patient-centered care.[20,21]

While the findings are encouraging, certain limitations should be noted. The study was conducted in a single institution with a relatively modest sample size, which may limit generalizability. The reliance on self-reported perceptions introduces the possibility of response bias, and the lack of a control group makes it difficult to fully isolate the effect of ECE from other academic influences. Nevertheless, the significant improvements in both subjective and objective outcomes provide strong evidence for the effectiveness of early clinical exposure. Despite these limitations, the findings carry important implications for medical education. Early clinical exposure should be formally integrated into the first-year MBBS curriculum with clear objectives that strengthen the link between basic sciences and clinical practice. Faculty members should be trained to facilitate these sessions effectively, as consistent supervision and feedback are essential for meaningful student learning.

CONCLUSION

It is concluded that early clinical exposure is an effective, well-accepted, and impactful teaching-learning approach that bridges the gap between preclinical and clinical training. Wider implementation of structured ECE, supported by institutional commitment and faculty training, has the potential to produce competent, empathetic, and patient-centered physicians better prepared for the challenges of modern healthcare. This study highlights the significant benefits of introducing early clinical exposure (ECE) into the first-year MBBS curriculum. Structured exposure to clinical settings not only enhanced students' academic performance but also improved their motivation, confidence, communication skills, and professional orientation.

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